

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: October 18, 1979

Forwarded to:

Honorable Neil Goldschmidt
Secretary
Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

R-79-65 through -67

The National Transportation Safety Board has become increasingly concerned that solutions to certain safety problems or issues of national significance have not been implemented or have not been implemented as rapidly as they should have been, even though the needed improvements were known, feasible, and timely. Beginning in fiscal year 1979, therefore, the Safety Board has attempted to target several problems each year and aggressively pursue implementation of specific improvements during that year. One of the Safety Board's safety objectives during fiscal year 1979 was to monitor the safety performance and modification program of the railroad hazardous materials tank car fleet. 1/

Between the years 1968 and 1978, DOT 112A/114A tank cars were involved in numerous serious accidents. In many of the accidents, couplers disengaged and overrode each other, puncturing the "heads," or ends, of tank cars. The contents of punctured tank cars carrying liquefied petroleum gas (LPG) or other hazardous materials exploded and fire erupted, resulting in death, injury and extensive property damage. In some cases, the intense heat caused other tank cars to erupt in "Boiling Liquid-Expanding Vapor Explosions" (BLEVE's) in which huge sections of steel tank weighing several tons rocketed to distances up to one-half mile. Punctures of tank cars containing other hazardous chemicals resulted in release of toxic gases which were carried over surrounding areas by wind currents. In one case, a cloud of toxic anhydrous ammonia was tracked by radar to a distance of 9 miles from an accident site before it dissipated.

1/ See the Safety Board's "Safety Report on the Progress of Safety Modification of Tank Cars Carrying Hazardous Materials" (Report No. NTSB-SR-79-2).

The major safety corrections required, shelf couplers and headshields, as well as the less urgent need for thermal insulation of certain DOT 112/114 tank cars to improve resistance to thermal rupture, were known to the Federal regulatory agencies, the shippers, the lessors, the tank car owners, and the railroad industry as early as 1971-1972.

In 1974 the Department of Transportation issued regulations requiring that all DOT 112/114 tank cars be equipped with headshields by December 1977. However, the requirements were challenged in court by some shippers, tank car owners, and lessors. Although that challenge was not successful, the headshield retrofit program was effectively blocked.

On April 10, 1975, the Safety Board recommended that the Federal Railroad Administration determine the capabilities of shelf couplers, headshields, and a combination of both for DOT 112/114 tank cars, and require retrofit of the best practical combination. The Department of Transportation initiated rulemaking action which culminated in the adoption of new regulations on September 15, 1977. The regulations established deadlines of July 1, 1979, for installation of shelf couplers and December 31, 1981, for installation of tank head protection and thermal insulation.

In the 6 months following issuance of the regulation, three train derailments demonstrated that accident consequences could be far more severe than past accident experience indicated. The 3 accidents killed 26 people, injured 205, and caused an estimated \$3.5 million in property damage. 2/

The critical and continuing nature of the accident consequences, as demonstrated by these three accidents, prompted the Safety Board to convene a national public hearing into derailments and hazardous materials on April 4-6, 1978. 3/ As a result of the hearing, the Safety Board issued recommendations urging that the Department of Transportation accelerate the shelf coupler and headshield installation program to require completion by December 25, 1978. Another recommendation, of lower priority, called for retrofit of thermal insulation as soon as possible, but not later than the existing deadline of December 31, 1981.

In response to these safety recommendations, the Department of Transportation issued amended regulations to accelerate the retrofit program. Under the accelerated

2/ See the Safety Board's Railroad Accident Reports: "Louisville and Nashville Railroad Company Freight Train Derailment and Puncture of Anhydrous Ammonia Tank Cars at Pensacola, Florida, November 9, 1977" (Report No. NTSB-RAR-78-4); "Derailment of Louisville and Nashville Railroad Company's Train No. 584 and Subsequent Rupture of Tank Car Containing Liquefied Petroleum Gas, Waverly, Tennessee, February 22, 1978" (Report No. NTSB-RAR-79-1); and "Derailment of Atlanta and Saint Andrews Bay Railway Company Freight Train, Youngstown, Florida, February 26, 1978" (Report No. NTSB-RAR-78-7).

3/ See the Safety Board's Safety Effectiveness Evaluation, "Analysis of Proceedings of the National Transportation Safety Board Into Derailments and Hazardous Materials, April 4-6, 1978" (Report No. NTSB-SEE-78-2).

program, shelf coupler installations were to be completed by the date recommended by the Safety Board and the deadline for installation of thermal protection was accelerated by 1 year. However, the accelerated schedule for headshield installation permitted completion to be delayed for some tank cars until the end of 1980. Because of this delay, the Safety Board classified its recommendation for accelerated retrofit of headshields as "open - unacceptable action."

A significant element of the retrofit regulation is a provision that, for tank cars subject to both headshield and thermal insulation requirements, tank car owners may elect to meet the requirements by one of two methods for which different completion deadlines are specified. For tank cars retrofitted by the first method (the T retrofit), the deadline for installation of headshields is December 31, 1979. For tank cars retrofitted by the second method (the J retrofit), 65 percent of each owner's tank cars are to be completed by December 31, 1979, and the remaining 35 percent by December 31, 1980.

Under compliance reporting provisions, tank car owners were required to declare their retrofit elections in October 1978. The owners' declarations are not binding, however, and the regulations specifically require that retrofit elections be "updated" in quarterly reports to the Federal Railroad Administration. Unfortunately, the absence of effective controls in the regulations make it possible for owners, by changing their retrofit elections, to shift tank cars originally scheduled to meet the T retrofit deadline (requiring installation of headshields on all affected tank cars by the end of 1979) to the J retrofit deadline (requiring installation of tank head protection on only 65 percent of those tank cars by that time and completion on the remaining 35 percent by the end of 1980).

Compilations of tank car owners' compliance reports by the Federal Railroad Administration indicate that several thousand tank cars which were formerly scheduled for the T retrofit have already been shifted to the J retrofit schedule. The effect of this shift is that the number of tank cars which may be permitted to continue to operate without tank head protection until the end of 1980 has increased by one-third, or about 1,100 tank cars.

The Safety Board has no position on the use of any method of thermal insulation which will meet the performance specifications established by the Department of Transportation. However, we believe that the exercise by tank car owners of the option to change the elected method of thermal insulation should not operate to further delay the accomplishment of tank head protection.

Another urgent need for tank car safety improvement was identified by the Safety Board as the result of a catastrophic derailment near Youngstown, Florida, on February 26, 1978, in which a DOT Specification 105 tank car was punctured, releasing anhydrous ammonia which killed 8 persons and injured 138. ^{4/} As a result of its investigation of the accident, the Safety Board issued a recommendation to the Secretary of Transportation to:

^{4/} See the Safety Board's Railroad Accident Report, "Derailment of Atlanta and Saint Andrews Bay Railway Company Freight Train, Youngstown, Florida, February 26, 1978" (Report No. NTSB-RAR-78-7).

"Require that top and bottom shelf couplers be installed on all DOT 105 tank cars as soon as possible. (Class I, Urgent Action) (R-78-58)"

On May 18, 1979, the Secretary responded:

"The Federal Railroad Administration (FRA) agrees that a retrofit program should be required so as to have appropriate Type E top and bottom shelf couplers and Type-F top shelf couplers installed on all DOT Specification 105 tank cars at an early date. However, the FRA feels that this requirement should be only part of a total effort that would result in DOT Specification 105 tank car being equipped with steel jacket heads.... A Notice of Proposed Rulemaking is being developed covering these safety measures. It is anticipated that a draft of this NPRM will be sent to the Materials Transportation Bureau in May 1979 for their handling."

In response, the Safety Board in a letter dated July 5, 1979, stated its belief that the shelf coupler retrofit for DOT 105 tank cars will be unnecessarily delayed if this safety program is incorporated with the puncture resistance and thermal protection programs. The letter pointed out that problems experienced in the thermal insulation portion of the "T" retrofit program for DOT Specification 112/114A tank cars have delayed the headshield retrofit, and suggested that tying a relatively simple shelf coupler program to more complex programs would needlessly delay a high priority safety improvement.

The Board believes that installation of shelf couplers on DOT tank cars should receive top priority, and that installation of the shelf couplers should not be delayed while additional safety improvements are developed. The Safety Board has urged that the FRA reconsider its position and initiate the necessary rulemaking as soon as possible.

As of August 27, 1979, the Materials Transportation Bureau of the Research and Special Programs Administration had not received the draft NPRM for safety improvements on DOT Specification 105 tank cars. The Safety Board believes that further delay by FRA in developing a proposed rule will prolong the unreasonable risk to the public of loss of life, serious injury, and damage to property and environment from preventable releases of hazardous materials in train accidents.

Therefore, the National Transportation Safety Board recommends that the Secretary of Transportation:

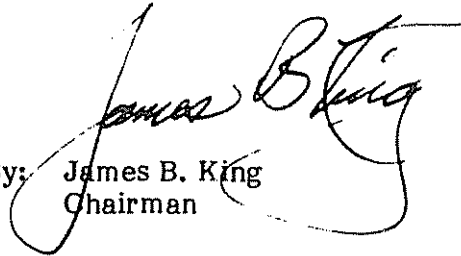
Require that DOT Specification 112 and 114 tank cars which have been shifted from the T retrofit to the J retrofit be equipped with tank head protection by December 31, 1979. (Class I, Urgent Action) (R-79-65.)

Provide that tank cars which have been shifted from the T retrofit to the J retrofit are not to be counted in the requirement for 65 percent retrofit completion of J tank cars by December 31, 1979. (Class I, Urgent Action) (R-79-66.)

Issue promptly a regulation to require that all DOT Specification 105 tank cars which transport hazardous materials be equipped with top and bottom shelf couplers by December 25, 1980. (Class I, Urgent Action) (R-79-67.)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, concurred in these recommendations.

By: James B. King
Chairman

A handwritten signature in cursive script, appearing to read "James B. King", written over the typed name and title.